

# **Licensing wh-in-situ<sup>\*</sup>**

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**Abstract:** This article examines French wh-in-situ. We argue that wh-in-situ in French is licensed by an intonation morpheme, which also licenses yes-no questions. Movement of Q-feature of an in-situ wh-word is required to disambiguate the underspecified intonation morpheme. The underspecification nature of this intonation morpheme leads to limited distribution of French wh-in-situ. We further compare French wh-in-situ with Chinese and Portuguese, showing that surfacy wh-in-situ can in fact have different properties.

## **1. Introduction**

Wh-in-situ has been a central topic of discussion in numerous papers in the literature since at least the 70's. Typical questions which arise with wh-in-situ are: what allows the wh-words to remain in-situ? do they undergo covert wh-movement? and how are the in-situ wh-phrases interpreted? In this paper, based on data from French, we reexamine the licensing environments of wh-in-situ. In particular, we defend two hypotheses: (a) there are two types of wh-in-situ, one involves wh-feature movement at LF and the other involves no movement; and (b) intonation, just like wh-particle and real wh-words, can play a central role in the licensing of wh-in-situ.

We begin our discussion by looking at the different types of wh-in-situ. We then examine in-situ in French in detail (section 2). The role of the intonation as well as its syntactic and semantic ramification will be analyzed. In section 3, we further examine a root constraint

involved in French wh-in-situ questions. Finally, the issue of optionality involved in French wh-questions, as well as Bos\*kovic! (1997) account of wh-in-situ in French, will be addressed in section 4.

### 1.1. Types of wh-in-situ

One type of wh-in-situ commonly found in natural languages is the kind we find in multiple questions. In such questions, one wh-word is moved and another stays in-situ, as in (1).

(1)     who bought *what*

In such cases, it can be said that the in-situ wh-word *what* is allowed to remain in-situ because of the moved wh-word. Within the Minimalist framework (e.g., Chomsky 1995), the in-situ *what* in (1) does not need to move (and therefore cannot do so) because the strong Q feature in the matrix  $C^0$  is already checked by *who*. The wh-feature of *what* will not be attracted to  $C^0$  as a consequence. The in-situ wh-word is interpreted via a process of unselective binding or choice functions (Reinhart 1998; see Pesetsky 1998 for a different account). We will discuss the interpretation of in-situ wh-words further below.

Let's now turn to a second type of wh-in-situ, in languages such as in Chinese/Japanese. Wh-in-situ in these languages is not limited to multiple questions. Such languages are different from English in that they typically have wh-particles. We assume here that insertion of the wh-particle (i.e., an overt or null Q-morpheme) checks the Q feature in  $C^0$  (see section 2.2), allowing the wh-words to stay in-situ (cf. Cheng 1991, see also Tsai 1994b).

- (2)    hufei   mai-le    shenme    (ne)  
        Hufei   buy-PERF   what        PRT  
        'What did Hufei buy?'

In other words, the Chinese/Japanese wh-particle plays the same role with respect to the in-situ wh-word as the moved wh-word does in English multiple questions. In both cases, a wh-word can stay in-situ because of the presence of another wh-element, a wh-word or wh-particle. This wh-word or a wh-particle checks the Q feature in  $C^0$ , and thereby voids the need of the in-situ wh-words to undergo movement. Both types of wh-in-situ also illustrate that there is an asymmetry between in-situ questions and questions involving extraction: in-situ wh-arguments (i.e., those that are not adverbials, cf. Tsai 1994a and Reinhart 1998) can appear in islands:<sup>1</sup>

- (3)    a.    Who likes the book that who wrote?  
        b.    hufei xihuan   nei-ben shei   xie    de shu                    (Mandarin Chinese)  
              Hufei like     that-CL who    write   DE book  
              'Who is the person x such that Hufei likes the book that x wrote?'

Though English and Chinese can be said to be similar with respect to wh-in-situ in the above sense, the two languages differ in that in simple single questions: English wh-words must move while Chinese wh-words do not. This difference can be derived from the fact that English lacks Chinese-style wh-particles which can check the  $C^0$  feature (see Cheng 1991). The Q feature in English  $C^0$  can only be checked by moving a wh-phrase to the checking domain of  $C^0$  (e.g., SpecCP), while the Q feature in Chinese/Japanese  $C^0$  is checked through the insertion of a wh-particle.

Aside from these two types of wh-in-situ, there is a third type, exemplified by French, which appears to allow both the in-situ and the movement option.<sup>2</sup> As is well-known, French

allows wh-in-situ outside the context of multiple questions (Aoun, Hornstein and Sportiche 1981) (see (4a)). However, French wh-in-situ appears to be distinct from English/Chinese wh-in-situ in that (a) unlike Chinese/Japanese, there is no wh-particle that appears to satisfy Q feature of  $C^0$ ; and (b) in-situ wh-arguments appear in very restricted environments (see sections 2.2 and 3) and are certainly not allowed in islands (4b):

- (4) a. Jean a acheté quoi  
       Jean has bought what  
       'What has Jean bought?'  
       b. \* Jean aime le livre que qui a écrit  
           Jean like the book that who has written  
           'Who is the person x such that Jean likes the book that x wrote?'

The availability of an in-situ option in French thus raises interesting questions concerning the typology of wh-in-situ. In particular, what element in French checks the Q feature of  $C^0$ , therefore allowing the wh-word to stay in-situ? Second, what leads to the restricted distribution of wh-in-situ? Bos \*kovic! (1997) suggests that French wh-in-situ derives from the absence of an interrogative  $C^0$  in overt syntax. With no interrogative  $C^0$ , nothing needs to be checked in overt syntax. However, a closer look at in-situ wh-questions in French reveals that these wh-questions do have other properties that are crucial in legitimizing the in-situness. As Wachowicz (1978) suggests, languages have cues for marking wh-questions (see also Cheng 1991). It appears that the question cue in French wh-in-situ is provided by special intonation which is absent in sentences with wh-movement. We discuss this in section 2.

## 2. French in situ questions

### 2.1. Intonation and interpretation

One distinct characteristic of French in-situ wh-questions is the intonation. Aside from in-situ wh-questions, French allows two other forms of wh-questions, one involving *est-ce que* (5a) and the other one involving (complex) inversion (5b). The intonation in these wh-questions differs from an *intonational yes-no question* (6), which is a yes-no question solely marked by intonation (i.e., a yes-no question without inversion or *est-ce-que*).

- (5)    a.    Quel livre    est-ce que    Jean a    acheté?  
              which book EST-CE QUE Jean has bought  
              ‘Which book did John buy?’  
      b.    Quel livre Jean a-t-il acheté?  
              which book Jean has-he bought  
              ‘Which book did John buy?’
- (6)            Jean a acheté un livre?                    (rising intonation)  
              ‘Jean has bought a book?’

The questions in (5a) and (5b) involve a non-rising intonation. This differs clearly from the intonation in (6), which has a rising intonation. For ease of exposition, we call the intonation in (6) *yes-no intonation*.

Consider now in-situ wh-questions such as (4a), repeated below.

- (4a)    Jean a    acheté quoi?  
              Jean has bought what

The intonation in (4a) is in fact comparable to the yes-no intonation in (6) in that there is a rising intonation, in contrast with the intonation exhibited in (5a,b). If we change the intonation of (4) to the intonation in (5a) or (5b) (let's call this *wh-intonation*), the sentence becomes ungrammatical. It thus appears that yes-no intonation plays a major role in licensing in-situ wh-

questions in French.

A second significant property of in-situ wh-questions in French is pointed out in Chang (1997). Chang notes that negative answers such as the one in (8) are not legitimate answers to in-situ wh-questions. This contrasts with wh-questions involving movement, as in (7), which allows a negative answer.

- |     |           |   |                           |
|-----|-----------|---|---------------------------|
| (7) | Question: | Qu'est-ce que Marie a acheté?<br>What EST-CE QUE Marie has bought | Answer: Rien<br>Nothing   |
| (8) | Question: | Marie a acheté quoi?<br>Marie has bought what                     | Answer: ??Rien<br>Nothing |

Chang notes that in-situ wh-questions in French are associated with a "strongly presupposed context (i.e., event)" (in contrast with a presupposed answer set). The interpretation of in-situ wh-questions in French seeks "... details on an already established (or presupposed) situation" (Chang 1997:45).<sup>3</sup> Consider (8) again. The question is only felicitous if the speaker assumes the event of Marie's buying something. What the question pertains to is the detail of the purchase (i.e., what exactly did Marie buy?). The negative answer in (8) is thus odd since the speaker presupposes the purchase of something. The difference between (7) and (8) shows that wh-questions involving movement in French do not have the "strongly presupposed context"; they are neutral wh-questions.

This difference in presupposed contexts, we suggest, is directly linked to how in-situ wh-word(s) are licensed in French, i.e., by the yes-no intonation. In fact, yes-no questions which are marked only by intonation also require a presupposed context. Consider the questions in (9).

- (9) a. Are you cooking tonight?  
 b. You are cooking tonight?

(9a) can be uttered either as a neutral question or as a question presupposing that the hearer is going to cook tonight. In contrast, (9b) is not a neutral question. In uttering this question, the speaker presupposes that the hearer is cooking tonight. In other words, the speaker presupposes a positive ‘yes’ answer. This property of the intonation question can be made explicit to the extent that (9b), but not (9a), can be followed by tags such as *I take it, I assume*. This question can be uttered when the speaker sees that the hearer is in the kitchen, apparently preparing for dinner.<sup>4</sup>

The wh-question in (8), *Marie a acheté quoi*, shows that in-situ wh-questions in French have similar presuppositional contexts as intonational yes-no questions. (8) presupposes that Marie bought something. This further shows that the licensing by the yes-no intonation plays a major role in French in-situ questions.

## 2.2. Wh-feature movement and intonational morphemes

To account for the role that intonation plays in licensing wh-in-situ in French, we propose that the intonation in the yes-no question in (6) is represented as a yes-no question morpheme in overt syntax, with a PF spell-out in the form of a rising yes-no intonation. We further suggest that question (Q-) morphemes can be specified or underspecified; they can either be specified as wh-question morphemes (specified with a [wh] feature), such as *-la* in Navajo or as yes-no morphemes (specified with a [yes/no] feature), such as the Chinese yes-no particle *ma*. Underspecified Q morphemes are thus compatible with both types of questions. We represent

the specification of feature as hierarchically structured pairs of attributes and values, in the sense of Scobbie's (1991) work on Attribute-Value Phonology. We take Q(uestion) to be an attribute which can take either of two (unary) values, [Q : Wh] or [Q : y/n]. The underspecified Q is represented as [Q : ].

We have seen that the yes-no intonational Q morpheme in French is not only used in yes-no questions but also in wh-questions. In this sense, the intonational Q-morpheme is like the overt complex Q-morpheme *est-ce que*, which can also occur both in yes/no and in wh-questions (for *est-ce-que* as a complex Q-morpheme, see Blanche-Benveniste et al. 1984, Rooryck 1994):<sup>5</sup>

(10) *Est-ce que* Jean a acheté un livre?  
'Did John buy a book?'

(5a) Quel livre *est-ce que* Jean a acheté?  
'Which book did John buy?'

From a theoretical point of view, this means that both *est-ce que* and the intonational Q-morpheme are underspecified for [yes-no] and [wh] features. The yes-no question in (6) can thus be represented (in overt syntax) as (11).

(11) Q Jean a acheté un livre  
[Q : ]

We assume that with this type of Q-morphemes, the underspecification of Q needs to be resolved. In (10) and (11), the underspecification of the Q-morpheme is resolved by a default operation, yielding a [y/n] value for the attribute Q at LF. In other words, at LF [Q : ] is set by default to [Q : y/n] (i.e., the default value of [Q : ] is [Q : y/n]). As a result, (11) is interpreted as a yes-no question, just as (10) is. (11) differs from (10) in that, at PF, the underspecified



intonational morpheme is realized under the form of a specific yes-no intonation.

Consider now cases in which the underspecified Q morpheme is used to license wh-in-situ. We propose that the underspecified Q morpheme in such questions is inserted to check the Q feature in  $C^0$ , just as wh-particles are merged in  $C^0$  to check the Q-feature of  $C^0$ . The representation of (4a) in overt syntax is (12).

(12)      $\bar{Q}$      Jean a acheté quoi  
          [Q : ]

If no operations take place at LF, (12) will yield an illegitimate interpretation since the default setting of the underspecified Q is [Q : y/n], as in (11). This default interpretation would leave the interpretation of the wh-word *quoi* unresolved. We therefore propose that, apart from filling in the default value (i.e., [y/n]), the underspecification of the Q-morpheme can be resolved in another way: at LF, the underspecification of Q can be resolved by movement of the wh-feature (e.g., of *quoi* in (12)) to  $C^0$ . We follow Chomsky (1995) and assume that only the features move at LF.<sup>6</sup> Movement of the wh-feature to  $C^0$  then sets the value of [Q : ] to [Q : wh]. In other words, the underspecified nature of the Q-morpheme triggers movement of the wh-feature. If there is nothing for the underspecified Q-morpheme to attract, it will end up having a default [y/n] interpretation. Importantly, however, LF feature movement does not occur for the purpose of *checking* the Q feature in  $C^\circ$ , since the interpretable Q feature in  $C^\circ$  is checked by the intonation morpheme itself. Rather, feature movement only serves to *disambiguate* the underspecified Q-feature by setting its value to [wh].<sup>7</sup>

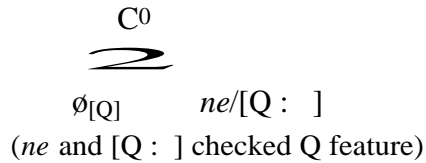
### 2.3. *Est-ce-que* vs. the intonation morpheme

One question that immediately arises here is why the Q-morpheme *est-ce que* does not avail itself of LF feature movement as well. Recall that under this analysis, both *est-ce que* and the intonation morpheme are underspecified [Q : ] morphemes. Nevertheless, *est-ce que* triggers overt movement of wh-elements while the intonation morpheme does not (as shown in (5a) and (13)).

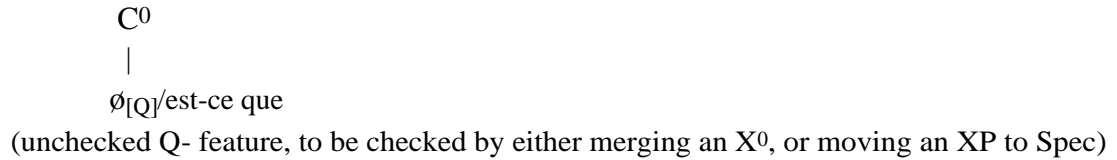
- (13) \**Est-ce que* Jean a acheté quel livre  
      *est-ce que* Jean has bought which book

We suggest here that the crucial difference between the intonation morpheme and *est-ce que* lies in their checking relation with respect to  $C^0$ . Chomsky (1995, p. 289) suggests that the feature which checks the Q feature of  $C^0$  can enter the checking domain by Merge or Move. If Merge is involved, it is possible to adjoin an  $X^0$  category (and *if* in English is a case in point) to the null  $C^0$ . Recall that we have assumed that the Chinese wh-particle is inserted (and thus merged) in  $C^0$  and thereby checks the wh-feature present in  $C^0$ . The French intonation morpheme is similar to the Chinese wh-particle in that it is likewise merged in  $C^0$  and subsequently checks the Q-feature of  $C^0$ . Since the Q-feature of  $C^0$  is checked, overt movement is precluded. In other words, in these cases, a null  $C^0$  carrying a Q-feature is checked by Merge of a Q-morpheme (a wh-particle or an intonational Q-morpheme). By contrast, we propose that the overt Q-morpheme *est-ce que* differs from the intonation morpheme in that it does not check the Q-feature of  $C^0$ . Rather, we take *est-ce que* to be an instantiation of the  $C^0$  feature itself, a feature which needs to be checked.

- (14) a. Chinese *ne* and French intonation Q



- b. French *est-ce que* and English null  $C^0$



Importantly, LF feature movement in French wh-in situ questions is not for feature-checking purposes. The Q feature itself is already checked by the intonation morpheme, as in Chinese wh-questions. Instead, feature movement is for disambiguation purposes: since the French intonation morpheme is underspecified (for [yes/no] or [wh]), wh-feature movement 'fills in' the value of the Q-feature in  $C^0$ , setting it to [wh].

It should be noted that *est-ce-que* and the yes-no intonational morpheme can in fact co-occur. That is, the yes-no question in (10) can be combined with yes-no intonation. In our analysis, this can indeed occur since the yes-no intonation is a morpheme which can serve to check the Q feature in  $C^0$ , in this case, *est-ce-que*. The co-occurrence of *est-ce-que* and yes-no intonation thus provides a piece of supporting evidence.<sup>8</sup>

We have already noted that *est-ce que* "triggers" overt wh-movement (5a). However, *est-ce que* plus the yes/ no intonation is not compatible with overt wh-movement; the combination yields only an echo interpretation. This follows from the analysis presented here, since either the intonation morpheme or wh-movement checks the Q feature represented by *est-ce que*, but not both.<sup>9</sup>

We would further like to point out that an underspecified [Q] is not a priori precluded in languages with only in-situ questions (e.g., Japanese, Chinese, Korean) (see footnote 4). A reviewer notes that in Korean, a sentence such as (15) can be interpreted either as a wh-question or a yes-no question:<sup>10</sup>

- (15) chelswu-ka mues-ul po-ass-ni  
 Chelswu-NOM what-ACC see-PAST-Q  
 a. 'What did Chelswu see?'  
 b. 'Did Chelswu see something?'

The question particle *ni* thus appears to be underspecified. The question that the reviewer raises is: how does the wh-interrogative interpretation arise if the wh-word is ambiguous (between a wh-word and an indefinite quantifier). Following Cheng (1991), (see also Watanabe 1992 and Tsai 1994b), a question word such as *mues* in Korean has the following representation:

- (16)  $\emptyset_{[wh]}$ -mues

In (16), *mues* represents the "core" of the wh-word (which is an indefinite) and the wh-force comes from a null wh-determiner (or a null wh-operator). If  $\emptyset_{[wh]}$  is present, it can undergo movement to disambiguate *ni*. On the other hand, if it is not present, a default value is filled in, yielding a yes-no interpretation. Given this account, the question particle *ni* in Korean is just like the intonation morpheme in French; it is underspecified for its yes-no or wh value.<sup>11</sup>

Our analysis suggests that in-situ wh-questions in French involve wh-feature movement at LF. We have briefly mentioned in section 1 that in-situ wh-words in multiple questions in English does not involve wh-feature movement at LF. The question that arises is thus whether there is in fact a difference between multiple wh-questions in English (and Chinese wh-questions)

and French in-situ wh-questions, which can be attributed to wh-feature movement. We noted earlier that the distribution of in-situ wh-questions is rather limited. Aside from the well-known restrictions we mentioned in the previous sections, Chang (1997) shows that there are in fact more subtle restrictions.<sup>12</sup> (The notation # is used in Chang 1997 to indicate that the sentence can be interpreted as an echo question only.)

- (17) #Tous les étudiants ont rencontré qui? (Chang 1997, p. 17, ex. 34)  
 All the students have met who  
 'Who did all the students meet?'
- (18) a. #Il n' a pas rencontré qui? (Chang 1997, p. 19, ex. 40)  
 He NE has not met who  
 'Who didn't he meet?'
- b. #Il peut rencontrer qui?  
 He can meet-INF who  
 'Who can he meet?'
- c. #Il admire toujours qui?  
 He admires always who  
 'Who does he always admire?'
- d. #Personne n'admire qui?  
 Nobody NE admires who  
 'Who does nobody admire?'

The restrictions shown in (17) and (18) easily follow from our analysis if we assume Honcoop's (1997) analysis of weak islands (see Beck 1996 for an alternative analysis). In Honcoop (1997), elements such as negation, modals, and quantifiers are considered to create an inaccessible domain between an operator and an indefinite. Given the analysis presented here, the movement of the wh-feature creates an operator-indefinite configuration, as shown in (19):

- (19) [ Q : wh<sub>i</sub> ] il admire **toujours** t<sub>i</sub>-indefinite<sub>[qui]</sub>

This analysis entails that wh-feature movement is sensitive to the intervention effect involving

negation, modals and quantifiers.

Consider now wh-in-situ in Chinese/English again. We have noted earlier that in these languages, wh-in-situ is much less restricted (and negation/modal/quantifiers do not block wh-in-situ in Chinese or English). This indicates that no wh-feature movement is involved in Chinese/English wh-in-situ. To interpret the in-situ wh-element(s), we follow Reinhart (1998) and assume that there is no need for wh-feature movement in the case of Chinese and English wh-in-situ. It thus naturally follows that inaccessible domains such as islands do not play a role in wh-in-situ in these two languages.<sup>13</sup>

### **3. The root properties of the intonational morpheme**

Aside from the special intonation, the intervention effects, French in-situ wh-questions have a further restriction. That is, French wh-words cannot stay in-situ in embedded clauses, as shown in (20).

- (20) \*Marie pense que Jean a acheté quoi  
Marie thinks that Jean has bought what

This, we suggest, is again due to the intonation Q-morpheme, which is a root morpheme: it appears only in matrix clauses and it has only matrix scope. Consider first the matrix scope property. This is not just an idiosyncratic property of the intonational Q morpheme. In French and English, both the intonationally marked yes-no questions in (21) and the non-intonation questions (22) are interpreted by default as asking a question regarding the matrix elements rather than the embedded ones:

- (21) a. Jean a dit que Guy a acheté un livre?  
           Jean has said that Guy has bought a book  
       b. John said that Bill bought a book?
- (22) a. Est-ce que Jean a dit que Guy a acheté un livre?  
           EST-CE QUE Jean has said that Guy has bought a book?  
       b. Did John say that Bill bought a book?

In both (21) and (22), the speaker is asking whether John said or John did not say that Bill bought a book. Importantly, they cannot be interpreted as asking whether John said that Bill did or did not buy a book. In other words, the scope of the question concerns the matrix sentence only, and it does not inquire about the truth of the embedded sentence, the purchase of a book.<sup>14</sup>

We suggest that this matrix scope property contributes to the ungrammaticality of (20).

Moreover, the yes-no intonational Q morpheme cannot license an indirect question. Sentences such as (23) are excluded simply because the intonational Q morpheme is a root morpheme, and thus cannot appear in an embedded C.

- (23) \*Je me demande que Jean a acheté quoi  
       I wonder that Jean has bought what

It should be noted that there is no correlation between underspecification and root property.

That is, it is well conceivable that a non-root morpheme can also be underspecified. In fact, European Portuguese is a case in point. In European Portuguese, the yes-no morpheme strategy of licensing wh-in-situ also exists in indirect questions, as shown in (24) (Joaõ Costa p.c.)

- (24) a. O Joao perguntou se tu compraste o livro  
           Joao asked whether you bought the book  
           'Joao asked whether you bought the book.'
- b. O Joao perguntou se/\*que tu compraste o quê

Joao asked whether/that you bought what  
'John asked what you bought.'

In contrast to French, Portuguese allows not only matrix wh-in-situ but also in-situ in indirect questions.<sup>15</sup> However, in indirect questions, the presence of *se* is obligatory (as shown in (24b)).

The use of *si* 'whether' however is not possible in French in the same context:

- (25) \*Je me demande si Jean a acheté quoi  
I ask whether Jean bought what

This illustrates that the underspecification that we see in French intonational Q-morpheme does not extend to the non-root yes-no morpheme, *si*. Portuguese non-root yes-no morpheme, *se* however, is similar to the yes-no intonational morpheme in French in being underspecified for [y/n] or [wh] features.

In other words, languages simply differ as to whether a yes-no morpheme has become underspecified; if it is, then the morpheme can be "borrowed" to license wh-questions. In English for example, though a yes-no intonation morpheme exists (shown in (9b) and (26b)), it cannot be "borrowed" to license wh-in-situ.

- (26) a. Jean a acheté un livre? (rising intonation)  
b. John bought a book? (rising intonation)

The yes-no intonation morpheme in French, on the other hand, has become underspecified, therefore allowing the licensing of wh-questions as well.

Comparing the [Q : y/n] value of the root intonational Q-morpheme in English with the underspecified [Q : ] value of the French root intonational Q-morpheme on the one hand, and the [Q : y/n] value of the French embedded Q-morpheme *si* with the underspecified [Q : ] value



of the Portuguese *se*, it appears that underspecified Q-morphemes originate as [y/n] markers and they gradually become underspecified and thus can license wh-elements. This generalization is further supported by the behavior of the embedded Q-morpheme *of* in the different dialects of Dutch. In Standard Dutch and many dialects, *of* functions as an embedded y/n morpheme and does not appear in embedded wh-interrogatives. However, there is at least one dialect of Dutch (Northern) in which *of* appears in both yes/no embedded questions and wh-questions, triggering movement of the wh-element (see, e.g. Hoekstra & Zwart 1994).

- (27) a. Ik vroeg of je zou komen (Standard Dutch)  
           'I asked whether you would be coming'  
       b. Ik vroeg wie (\*of) zou komen (Standard Dutch)  
           I asked who Q would be coming  
       c. Ik vroeg wie of (dat) zou komen (Northern Dutch)  
           I asked who Q that would be coming

Let us recapitulate our results so far. French wh-in situ is triggered by a root intonational Q-morpheme. This morpheme is underspecified as [Q : ], enabling it to license both root yes/no questions and root wh-questions. Furthermore, this morpheme is similar to the Chinese wh-morpheme in that it checks the Q-feature in C<sup>0</sup>, making overt movement of the wh-element unnecessary. The underspecified [Q : ] morpheme has a 'default' [Q : y/n] interpretation. In cases where a wh-word is in the scope of the Q morpheme, the wh-feature of the wh-word moves at LF to set the value of the underspecified [Q : ] morpheme to [Q : wh].<sup>16</sup>

In view of the many facts discussed, it is useful to give an overview under the form of a table of the various Q-morphemes discussed and their properties:

	French intonation	Chinese wh- particle	St. French <i>est-ce que</i>	Portu- guese <i>se</i>	French <i>si</i>	St. Dutch <i>of</i>	N. Dutch <i>of</i>
Checks Q- feature in C <sup>0</sup>	√	√		√	√	√	
Instantiates Q- feature in C <sup>0</sup>			√				√
[Q : ]	√		√	√			√
[Q : wh-]		√					
[Q : y/n ]					√	√	
root scope	√	√	√				
embedded scope		√		√	√	√	√
island sensitive	√		√	√	√	√	√
wh- word moves			√		n/a	n/a	√
Feature moves	√			√	n/a	n/a	

## 4. Some further issues

### 4.1. Bos\*<sup>1</sup>kovic! (1997)

Bos\*<sup>1</sup>kovic! (1997) proposes that French allows LF insertion of C<sup>0</sup> with a strong [+wh] feature.

This yields three immediate results:

- (i) in overt syntax in French, the wh-word in a sentence such as (4a) does not move because there is no feature yet to attract the wh-word,
- (ii) no wh-in-situ is allowed in indirect questions because LF insertion of wh-feature can only be at the root level, and
- (iii) At LF, after the insertion of the feature, the wh-feature of the wh-word moves to check the C<sup>0</sup>.

Bos\*<sup>1</sup>kovic! (1997) further argues that the feature movement is subject to head-movement

restriction. More specifically, feature movement is blocked by A'-heads. This thus rules out

cases in which an in-situ wh-word appears in an embedded clause (20) and it can also account for

(18a) involving negation.

However, Bos\*<sup>1</sup>kovic! (1997) fails in several respects. First, as we have pointed out, both the intonation and the interpretation of in-situ wh-questions differ from questions involving wh-movement. If  $C^0$  is only inserted at LF, it is hard to account for the relation between yes-no intonation and wh-in-situ intonation. Further, the difference between wh-movement and wh-in-situ in French is that the former involves generalized pied-piping. It is not immediately obvious how the lack of generalized pied-piping would affect the interpretation in terms of presuppositional contexts. Lastly, we have shown that the restrictions on wh-feature movement cannot be solely accounted for by having intervening A'-heads (such as  $C^0$  and  $Neg^0$ ), since quantifiers and modals have the same effect, as Chang (1997) has shown.

#### 4.2. Other types of wh-in-situ?

Now consider another type of in-situ wh-questions in French. These in-situ wh-questions differ from the in-situ questions such as (4a) in three respects:

- (i) the wh-words are not bare, but are suffixed with *ça* (28).
- (ii) Wh-*ça* cannot undergo movement (29a, b) , and
- (iii) Wh-*ça* questions require an answer from a contextually introduced set (i.e., D-linked). (Wh- *ça* questions are not echo-questions (30)).

(28) Tu as vu qui ça (cet après-midi)  
You have met who-that (this afternoon)

- (29) a. \* Qui ça as-tu vu?  
Who-that have you met?
- b. \* Qui ça est-ce que tu as vu?  
Who-that Q have you met?
- c. C'est qui ça que tu as vu? (cleft sentence with wh-in situ)

- (30) a. Speaker A: 'Paul est parti de Paris vers 1800h.' Paul left Paris around 6.00 p.m.  
 Speaker B: 'Et il arrive a Bruxelles quand ça exactement?'  
 'And he arrives in Bruxelles when-that exactly?'  
 b. Context: Paul has invited some colleagues for dinner and his wife asks him:  
 'Tu as invité qui ça ce soir?' you invited who-that this evening?

We will not discuss all the details connected to the *wh-ça* questions here. We would like to point out that *wh-ça* questions show that besides a morpheme that can check the Q feature in  $C^0$ , other factors may be operative in determining *wh-in-situ*. We have noted above that bare *wh-in-situ* questions appear to require yes-no intonation. This contrasts with the *wh-ça* questions, which do not require yes-no intonation, although they are compatible with it. The *wh-ça* elements appears to be the exact opposite of the *wh-the hell* elements in English: *wh-the hell* elements in English are required to move, while *wh-ça* elements in French are prohibited from moving.

- (31) a. What the hell did you buy?  
 b. \*Who bought what the hell?

Pesetsky (1987) shows that strongly non-D-linked *wh*-words such as *what the hell* must undergo movement while strongly D-linked *wh*-words do not undergo movement (see also Obenauer 1994). The French *wh-ça* can be considered to be the prime example of strongly D-linked *wh*-words. This D-linking property of *wh-ça* is probably related to the fact that the element *ça* 'that' occurs independently as a deictic pronoun in French.

However, it should also be noted that *wh-ça* questions show that syntactic restrictions play a role as well: the restrictions on typical *wh-in-situ* in French apply to *wh-ça* questions as well (i.e., the Chang (1997) facts). We will for now leave open the question of what forces a strongly D-linked *wh*-phrase such as *wh-ça* to be *in-situ*. These examples may make clear, however, that the choice between *wh*-movement and *wh-in situ* in a language like French is

strongly correlated with differences in interpretation that cannot be simply accounted for in terms of the strength of attraction or the moment of insertion of the Q-morpheme in  $C^0$ .

### 4.3. Optionality

So far, we have not touched upon the question of optionality. In French, wh-words can undergo wh-movement or stay in-situ. Given our analysis, optionality is only apparent. That is, it is not the case that wh-words optionally stay in-situ or optionally undergo movement. Instead, the apparent optionality rests upon whether or not the yes-no intonation morpheme is in the numeration. If the yes-no intonation morpheme starts out in the numeration and is merged in  $C^0$ , wh-word(s) in the sentence must remain in-situ. If the intonation morpheme is not in the numeration, movement must take place to check the Q-feature. The apparent optionality then simply is the result of different numerations. It should also be noted that the in-situ wh-questions have different interpretations from the wh-questions involving movement. Thus, it will also not fall within Reinhart's (1998) global economy.

This particular way of looking at optionality of wh-movement in French, however, leads to a potential problem in languages like Chinese. Recall that we assume that Chinese wh-questions involve a wh-particle, and the presence of the particle yields wh-in-situ just as the presence of a yes-no intonation morpheme yields wh-in-situ in French. The question that arises then is why Chinese does not allow for numerations without the wh-particle, leading to wh-movement.

This, we think, may relate to how wh-operators are introduced into the numeration.

Following Tsai (1994b), we suggest that the Chinese wh-operators are pairs consisting of a wh-word and wh-particle whereas English/French wh-operators are single lexical elements. When wh-operators in Chinese are introduced into the numeration, the pair is introduced, yielding a co-existence relationship between the wh-word and a wh-particle and thereby ensuring that there is no overt wh-movement in Chinese.

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1. Whether *wh*-in-situ leads to subjacency effects is not an entirely clear-cut matter. *Wh*-in-situ in Chinese and Imbabura Quechua for example does not induce subjacency effects (see Huang 1982, Cole and Hermon 1994). However, Watanabe (1992) shows that *wh*-in-situ in Japanese may or may not induce subjacency (depending on a couple of factors).

2. There are other languages which have been considered to have optional *wh*-movement, e.g., Bahasa Indonesia and Malay (see Cheng 1991, Saddy 1991, and Cole and Hermon 1998). It should be noted that the “optionality” in these languages appear to be less restricted than French.

3. Chang (1997) also shows that the presuppositional constraint on *wh*-in-situ sentences is not reducible to the more commonly known notion of D-linking (Pesetsky 1987). In the dialogue in (i) below, there is no salient element in the discourse that can ‘fill in’ the *wh*-in-situ object. Rather, it appears that the presupposition crucial for *wh*-in-situ involves the entire VP: the birthday context leads to a presupposition of buying presents.

- (i) A. C’est l’anniversaire de Pierre la semaine prochaine.  
       It is the birthday of Pierre the week next  
       ‘It’s Pierre birthday next week.’  
       B. Et tu vas lui acheter *quoi*?  
       And you will for-him buy what?  
       ‘And what will you buy for him?’

4. This of course does not prevent the hearer from answering “no”. However, the “no” answer is certainly not the expected answer. This suggests a distinction between ‘neutral’ and ‘non-neutral’ yes/no questions, which may be morphologically marked. French *est-ce que* and Chinese *ne* are root yes/no morphemes that mark ‘neutral’ questions, while the intonation morpheme marks non-neutral, ‘yes-biased’ questions. Such a distinction also exists for embedded questions in English: Bolinger (1977:96) observes that the embedded yes/ no morphemes *if* and *whether* behave differently, as illustrated in (i):

(i) John kept tossing so I asked him *if*/ *whether* he was awake  
 We take this difference to be the result of the positive presupposition carried by *if*, and the purely ‘neutral’ yes/ no interpretation associated with *whether*. *Whether* ‘seems to treat with equal seriousness the possibility of a *yes* and the possibility of a *no*’ (Bolinger 1977:96). By contrast, we analyse the more felicitous *if* in this context as the result of the positive presupposition associated with it: *if* presupposes that the answer will be positive, given that John’s tossing facilitates the speaker’s presupposition that he is indeed awake.

5. Similarly, Japanese (and Korean) feature matrix morphemes licensing both yes/no and *wh*-questions. (i) shows that in Japanese, the question marker *no* can appear in a yes-no or a *wh*-question (data from Yoshida and Yoshida 1998) (see also (15) in the text).

- (i) a. gakkooni ik-u no?  
       school-to go-pres Q  
       ‘Are you going to school?’  
       b. doko-ni ki-u no  
       where-to go-pres Q  
       ‘Where are you going?’



Like French *est-ce que* and the intonation morpheme, these morphemes must be viewed as a Q morpheme underspecified for [y/n] and [wh].

6. Our analysis can be recast in terms of *Agree* based on Chomsky (1998). For ease of discussion, we phrase our discussion in terms of feature movement.

7. This is in spirit similar to Simpson (to appear), who argues that overt wh-movement is to disambiguate  $C^0$ , which can be a head licensing wh-questions, yes-no questions, focus, etc. We differ from Simpson in that the  $C^0$  in our account necessarily carries a Q-morpheme, which in the case in French, needs to be disambiguated (at LF).

8. Note that given the assumptions made in Chomsky (1995), nothing prevents *est-ce-que* from co-occurring with the intonation morpheme in  $C^0$  (i.e., with the intonation morpheme adjoined to *est-ce-que*. This is comparable to adjoining *if* to a null  $C^0$  in English.

9. It should be noted that *est-ce-que* plus yes-no intonation cannot accommodate wh-in-situ. In our analysis, it entails that wh-feature movement in combination with *est-ce-que* and yes-no intonation is not sufficient in disambiguating *est-ce-que*.

10. The reviewer notes that there is an intonational difference between the yes-no and the wh variant. If the sentence is interpreted as a wh-question, the intonation peak is on the wh-word. On the other hand, with a yes-no question interpretation, either *Chelswu* or the verb carries the peak. This is not surprising since the wh-word in a wh-question naturally carries focus (and hence the intonation peak). Further work needs to be done before we can examine the connection between intonation and the question interpretation in Korean.

11. Lakhota appears to be similar to Korean in that the wh-word *táku* 'what' is also ambiguous between an indefinite and an interrogative reading, and that the question marker *he* can mark either a

yes-no question and a wh-question. However, with a wh-question reading, *he* and the wh-word *táku* cannot be separated by an island (data from van Valin and LaPolla 1997: 617):

- (i) wic\*háſ\*a ki [[ ſ\*ú4ka wa4 táku ø-ø-yaxtáke] ki le] wa4-ø-ø-yá4ka he  
 man the dog a 3sgU-3sgA-bite the this 3sgU-3sgA-see Q  
 'Did the man see the dog which bit something?'  
 \*'What did the man see the dog which bit?'

This follows from our account: in order to have the interrogative reading, the  $\emptyset_{[wh]}$  attached to *táku* has to undergo movement to disambiguate *he*. However, movement out of an island is not possible. For the yes-no reading, the default value of *he* is filled in.

12. Bos\**kovic!* (1997) also discusses the restriction related to negation (18a) and the matrix clause restriction (see section 3). We delay the discussion of Bos\**kovic!*'s account to section 4.1.

13. A remaining question with Reinhart's account is that though wh-words such as *why* cannot stay in islands in Chinese, they can very well stay in-situ. In Reinhart's account, *why* cannot be in-situ because it is an adverbial (without the proper set for choice functions). This rules out an in-situ *why* in Chinese simple questions as well. Tsai (1994a) however, suggests that though nominal wh-words do not undergo movement, wh-adverbials do.

14. One reviewer suggests that this claim is false on the basis of the fact that (22) "can be interpreted as asking about a book (possible felicitous answer *No, a boat*)". We think that this misconstrues the interpretation of the question: the denial *No a boat* does not indirectly involve a denial about the purchase of a book, rather, it is an elliptical answer for *No, John didn't say that Bill bought a book, John said that Bill bought a boat*.

15. Aside from the difference in the ability to have indirect in-situ wh-questions, Portuguese differs from French in many ways. See Cheng and Rooryck (in progress).

16. It is interesting to note that in the languages discussed here, it is always the yes/no morpheme that 'extends' its use to license wh-elements. In other words, it looks as if  $[Q : y/n]$  morphemes change more easily into underspecified  $[Q : ]$  morphemes than  $[Q : wh]$  morphemes do. This suggests that yes/no questions are in some way more 'basic' than wh-questions. We will leave this problem for future research.